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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

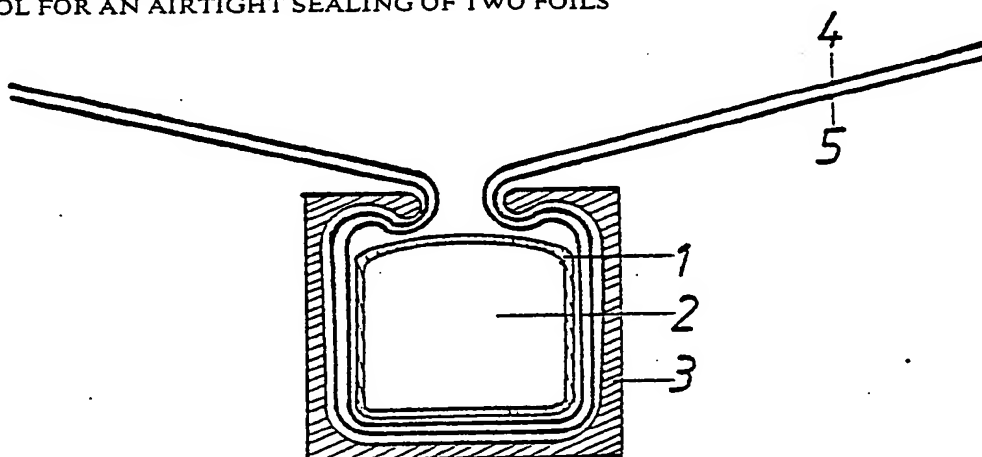
(51) International Patent Classification <sup>3</sup> :  <b>F16B 5/00; B29C 17/00</b>	<b>A1</b>	(11) International Publication Number: <b>WO 82/ 02751</b>  (43) International Publication Date: <b>19 August 1982 (19.08.82)</b>
(21) International Application Number: <b>PCT/DK82/00014</b> (22) International Filing Date: <b>10 February 1982 (10.02.82)</b> (31) Priority Application Number: <b>0472/81</b> (32) Priority Date: <b>11 February 1981 (11.02.81)</b> (33) Priority Country: <b>NO</b> (71)(72) Applicants and Inventors: <b>HINDSGAUL, Kim [DK/NO]; Otto Rogesvei 35 A, N-1372 Østerås (NO). OLAFSEN, Walther [NO/NO]; Kirkeveien 19, N-Oslo 2 (NO).</b> (74) Agent: <b>LARSEN &amp; BIRKEHOLM A/S; Niels Hemmingsens Gade 32, DK-1153 København K (DK).</b>		(81) Designated States: <b>AT (European patent), AU, BE (European patent), CH (European patent), DE, DE (Auxiliary utility model), DE (European patent), DK, FI, FR (European patent), GB, GB (European patent), JP, LU (European patent), NL, NL (European patent), SE, SE (European patent), US.</b>  Published <i>With international search report.</i> <i>In English translation (filed in Danish).</i>

(54) Title: METHOD AND TOOL FOR AN AIRTIGHT SEALING OF TWO FOILS

## (57) Abstract

For producing an airtight sealing of two foils (4, 5) a metal slide (3) is used that is open in the side, and a flexible tube (1), the cavity (2) of which is hermetically sealed, as the foils (4, 5) are led into the slide (3) with the tube (1) at the top, after which a pressure is put to the cavity (2) of the tube so that it will expand and thus press the foils (4, 5) against the inner walls of the slide and in this way secure a complete sealing

between the parts. When the pressure is removed from the interior of the tube, the parts can be easily separated and the method can be repeated. For placing the foils (4, 5) and the tube (1) in the right way a tool can be used, which consists of rolls (6, 7, 8) so that the foils (4, 5) and the tube (1) are placed correctly in the slide (3) when the tool is taken across the slide (3) by means of the rolls (8, 6).



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## 1 METHOD AND TOOL FOR AN AIRTIGHT SEALING OF TWO FOILS

The invention relates to an airtight sealing of two foils and a tool for practising this method.

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When sealing bags of e.g. plastic foil it is difficult, when handling large sizes, to obtain a sealing by simple means, which can be re-opened and then sealed again if desired without any damage to the foil. As such bags furthermore are rather expensive, there is a considerable economic risk connected to the use of the hitherto known sealing methods.

10 These methods may most often consist of rolling the edge of the foils and keeping the material by means of tape or the like.

When large foil bags which e.g. shall be used for storage of crops or the like are to be sealed, the sealing must take place all the way round the bag; and secure an airtight connection of the underlaying foil and the top foil. This must take place in a simple way without damage to the foils, and besides, the sealing must be able to be re-opened if desired and sealed again, which is not possible by means of the hitherto known methods. Furthermore, the sealing must be completely airtight.

It is the object of the invention to meet these shortcomings and to improve the sealing method, and this is obtained by means of a method according to the invention, where the sealing area of the two foils is placed into a hollow slide through a longitudinal groove in the slide, after which a flexible airtight tube is placed into it, which tube is then

1 inflated to press the foils against the inner walls  
of the slide. In this way an airtight sealing of two  
or more foils can be obtained by simple means, which  
sealing can be released without damage to the foil,  
5 as the inflated tube will press the foils with an even  
and constant pressure against the inner walls of the  
slide. The method is also very quick, and can be  
easily practised anywhere, as there is no special  
need for an air pressure source, because e.g. a hand-  
10 operated pump can easily supply the desired pressure  
to the tube.

When using the tool of claim 2 the parts can be led  
down into the slide by just rolling the tool across  
15 the slide so that the materials are put in the right  
place in this.

Finally it is appropriate as mentioned in claim 3, to  
provide the tool with a backstop roll, as the placing  
20 of the foils and the tube can be effected without the  
slide having to rest on a firm foundation.

The invention will be further described in the follow-  
ing with reference to the drawing, where

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Fig. 1 shows a sectional view of the  
parts before the sealing,

Fig. 2 shows a sectional view of the  
parts after the sealing,

30

Fig. 3 shows a sectional view of the  
parts, when being put into  
place, and

Fig. 4 shows a sectional view of the  
parts, seen in the direction  
35 IV-IV in Fig. 3.

1 The method will be described with reference to the parts, shown in Figs 1 and 2, i.e. the foils 4 and 5 which can be a sealing area of a foil sack or an underlaying foil 5 and a top foil 4 in a silo.

5 Along the complete sealing area a slide 3 mainly of metal as e.g. aluminum is provided, which in the shown example is in the shape of a hollow slide with a longitudinal opening or groove at the top.

10 The foils are first put down into the slide, and then a flexible airtight tube 1 is pressed down into the slide at the top of the foils. The tube is airtight, as already mentioned, and further provided with a supply for pressure air. Then a pressure is put to the cavity 2 of the tube, which thereby expands and presses the foils 4, 5 out against the interior of the tube for the formation of a completely airtight connection between the foils, as shown in Fig. 2.

20 When removing the pressure from the tube, this can easily be drawn out of the slide together with the foils, after which the method can be repeated. Thus no damage overtakes the parts, and thus the sealing can take place at any desired place on the foil, so that e.g. the volume of a bag may be varied according to the need.

30 For the placing of the parts the tool shown in Figs 3 and 4 can be used. It consists of a handle or a frame 9, to the upper part of which a wheel 6 is mounted, which is rounded along the outside so that it can run in the groove at the top of the slide 3. In front of this wheel 6 a smaller roll 8 is mounted

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1 which can run inside the slide and press down the  
foils, as shown in Fig. 3.

To the handle 9 a further roll 7 is mounted which  
5 can abut on the underside of the slide, and thus  
form a counterpressure against the other wheels  
6 and 8.

When this tool is led across the parts the wheel 6  
10 presses the tube 1 down into the slide 3, while the  
first smaller roll 8 presses the foils 4 and 5 down  
in front of the tube 1. Thus the correct placing of  
the parts in the slide is secured so that the parts  
will not be damaged when pressure is put to the ca-  
15 vity of the tube.

In order to make the handling of the tool easier,  
the handle 9 can be provided with a not-shown prolon-  
gation, so that you can drive the tool across the  
20 slide in upright position, when the slide is  
on a foundation on a level with the ground.

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## C L A I M S

1. Method for an airtight sealing of two foils,  
c h a r a c t e r i z e d i n that the sealing  
5 area of the two foils (4, 5) is placed into a  
hollow slide (3) through a longitudinal groove in  
the slide, after which a flexible tube (1) is  
placed into it, which tube is then inflated to press  
the foils (4, 5) against the inner walls of the slide  
10 (3).
2. Tool for practising the method according to  
claim 1, c h a r a c t e r i z e d i n that it  
comprises a wheel (6) with a mainly convex outer  
15 sectional form that permits the wheel (6) to run in  
the groove of the slide (3), and a further roll  
(8) that can run inside the slide against its end  
wall.
- 20 3. Tool according to claim 2, c h a r a c t e r i -  
z e d i n that a backstop roll (7) is mounted  
which runs against the outer end wall of the slide (3).

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Fig.1

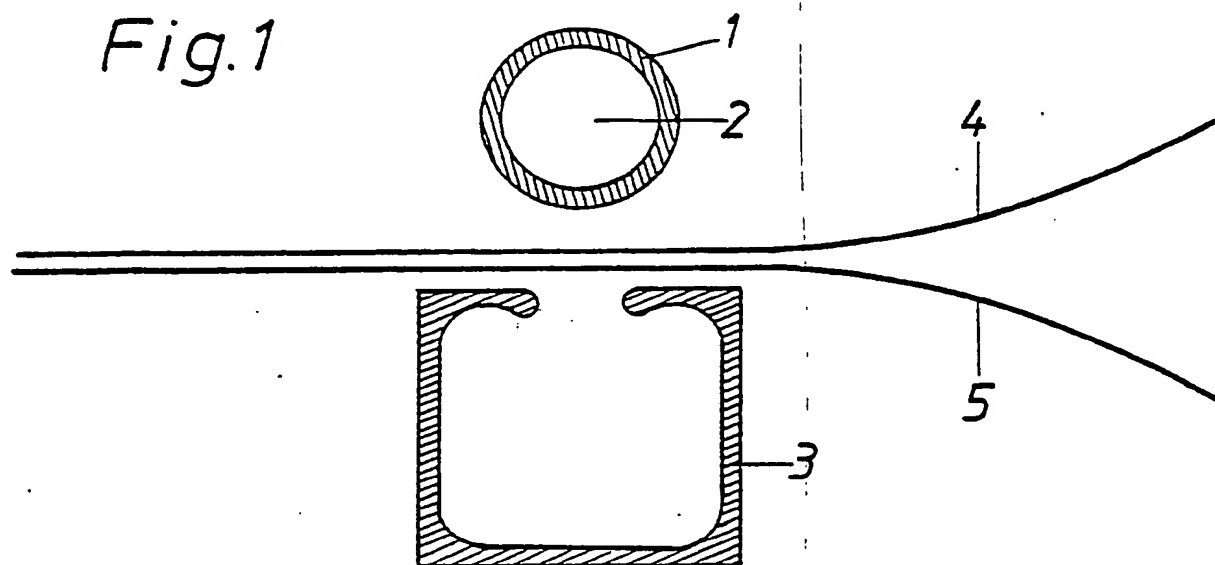
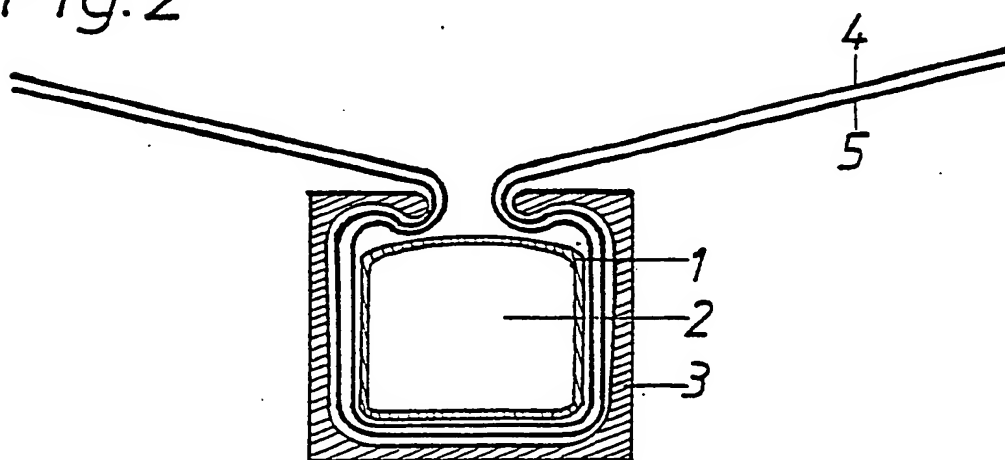
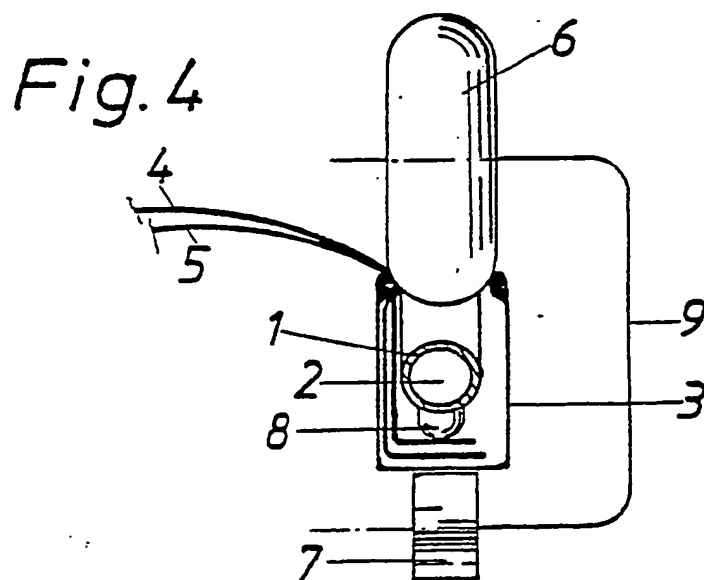
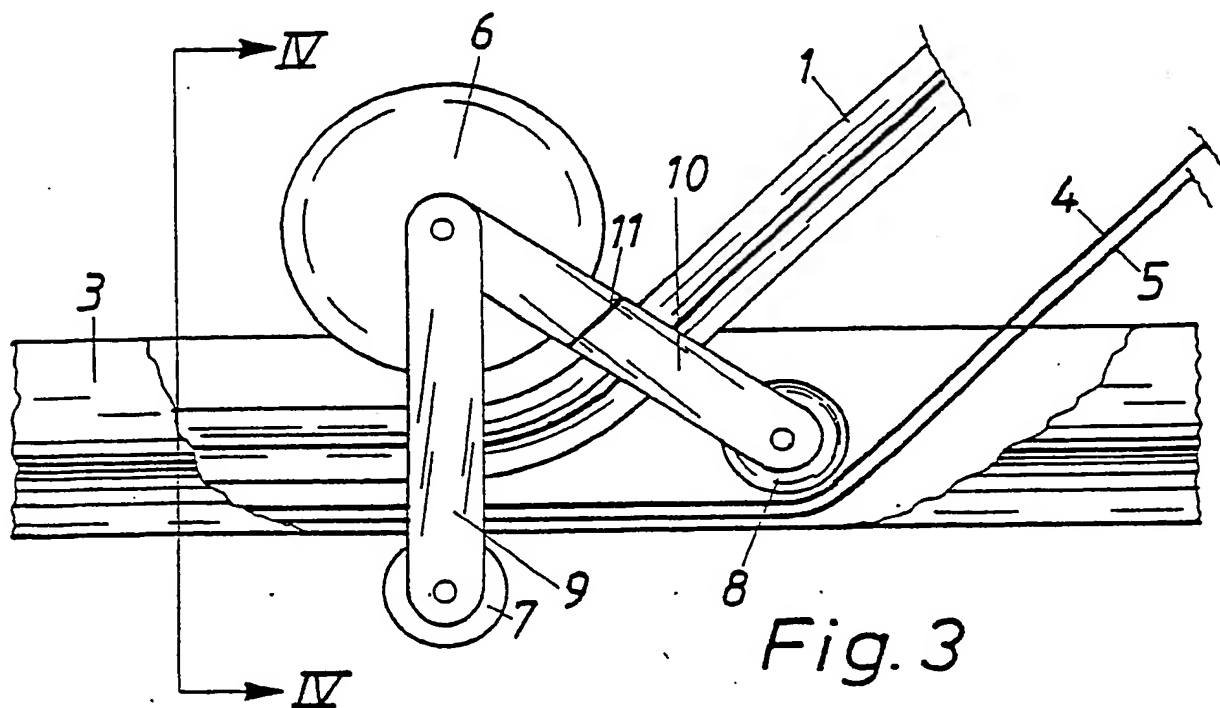


Fig.2



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# INTERNATIONAL SEARCH REPORT

International Application No. PCT/DK82/00014

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>3</sup> According to International Patent Classification (IPC) or to both National Classification and IPC <sup>3</sup> <div style="text-align: center; font-family: monospace; font-size: 1.2em;">F 16 B 5/00, B 29 C 17/00</div>														
<b>II. FIELDS SEARCHED</b> <div style="text-align: center; font-size: 0.8em;">Minimum Documentation Searched <sup>4</sup></div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%; font-size: 0.8em;">Classification System</th> <th style="font-size: 0.8em;">Classification Symbols</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top;">IPC 3</td> <td style="font-family: monospace; font-size: 0.9em;">B 29 C 17/00, 27/00, B 29 D 31/00, F 16 B 2/20-2/24, 5/00, 5/06, 5/12, B 65 D 77/10-77/18, B 65 B 51/00-51/04, 7/00-7/06, A 01 G 9/14, 9/16 .../...</td> </tr> </tbody> </table> <div style="text-align: center; font-size: 0.8em; margin-top: 5px;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>5</sup></div> <div style="padding: 10px; font-family: monospace; font-size: 1.1em;">SE, NO, DK, FI classes as above</div>			Classification System	Classification Symbols	IPC 3	B 29 C 17/00, 27/00, B 29 D 31/00, F 16 B 2/20-2/24, 5/00, 5/06, 5/12, B 65 D 77/10-77/18, B 65 B 51/00-51/04, 7/00-7/06, A 01 G 9/14, 9/16 .../...								
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<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> <sup>14</sup> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; font-size: 0.8em;">Category <sup>6</sup></th> <th style="font-size: 0.8em;">Citation of Document, <sup>16</sup> with indication, where appropriate, of the relevant passages <sup>17</sup></th> <th style="width: 10%; font-size: 0.8em;">Relevant to Claim No. <sup>18</sup></th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td>SE, B, 7704013-7 (M KONTINEN) 6 August 1979</td> <td></td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td>FR, A, 2 208 770 (ETHYLENE PLASTIQUE) 28 June 1974</td> <td></td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td>US, A, 3 149 943 (MARTIN R AMADOR) 22 September 1964</td> <td></td> </tr> </tbody> </table>			Category <sup>6</sup>	Citation of Document, <sup>16</sup> with indication, where appropriate, of the relevant passages <sup>17</sup>	Relevant to Claim No. <sup>18</sup>	A	SE, B, 7704013-7 (M KONTINEN) 6 August 1979		A	FR, A, 2 208 770 (ETHYLENE PLASTIQUE) 28 June 1974		A	US, A, 3 149 943 (MARTIN R AMADOR) 22 September 1964	
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<div style="font-size: 0.8em;"> <p>* Special categories of cited documents: <sup>15</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div>		<div style="font-size: 0.8em;"> <p>"T" later document: published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"Z" document member of the same patent family</p> </div>												
<b>IV. CERTIFICATION</b> <table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;">           Date of the Actual Completion of the International Search: <sup>1</sup>  <div style="text-align: center; font-family: monospace; font-size: 1.1em;">1982-04-13</div> </td> <td style="width: 50%; vertical-align: top;">           Date of Mailing of this International Search Report <sup>2</sup>  <div style="text-align: center; font-family: monospace; font-size: 1.1em;">1982-04-29</div> </td> </tr> </table>			Date of the Actual Completion of the International Search: <sup>1</sup> <div style="text-align: center; font-family: monospace; font-size: 1.1em;">1982-04-13</div>	Date of Mailing of this International Search Report <sup>2</sup> <div style="text-align: center; font-family: monospace; font-size: 1.1em;">1982-04-29</div>										
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International Searching Authority: <sup>1</sup> <div style="text-align: center; font-family: monospace; font-size: 1.1em;">Danish Patent Office</div>		Signature of Authorized Officer: <sup>20</sup> <div style="text-align: center;">               Per-Olof Varnbo           </div>												

## FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

II

Fields Searched (cont)

US Cl 53:77, 138, 266, 373

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE <sup>10</sup>

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers ..... because they relate to subject matter <sup>12</sup> not required to be searched by this Authority, namely:2. ☐ Claim numbers ..... because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out <sup>13</sup>, specifically:VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING <sup>11</sup>

This international Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the international Searching Authority did not invite payment of any additional fee.

## Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.☐ ..... test accompanied the payment of additional search fees.